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Ammunition Advocate



The mission of the Executive Director for Conventional Ammunition (EDCA) is to manage and execute activities of a joint-Service nature necessary to carry out the responsibilities of the Single Manager for Conventional Ammunition (SMCA). Responsibilities include oversight of planning, programming, and budgeting for resources to accomplish the SMCA mission; coordinating SMCA related issues with the Services and the Office of the Secretary of Defense; and acting as the focal point on critical joint-Service SMCA issues.

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In November 2001, the Office of the Under Secretary of Defense (Acquisition, Technology and Logistics (Land Warfare & Munitions)) requested the Joint Ordnance Commander's Group (JOCG) conduct a special study of the Single Manager for Conventional Ammunition (SMCA) and to update DoD policy and related documents that govern the SMCA operations.

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Responsibilities of the SMCA and the Military Services."

The JOCG fully endorsed the changes made by the Special Study Group and extended their appreciation to CAPT Birdwell for leading this effort and to the SMCA SSG for their outstanding contributions in performing this important task. Both documents were forwarded to OSD for staffing and approval on 20 April 2003. Subsequently, the PDUSD(AT&L) forwarded the draft DoDD 5160.65 and draft DoDI 5160.68 to the Military Department Secretaries, Commandant of the Marine Corps, and U.S. Special Operations Command for coordination. Suspense for responses on the DoDD is July 31, 2003. Suspense for responses for the DoDI is August 8, 2003. The draft documents are on the Mission page of the O/EDCA website (<http://www.amc.army.mil/edca/>).

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Automatic Identification Technology (AIT)

By Mr. D.E. "Ben" Herr

Automatic Identification Technology (AIT) is a suite of tools used to eliminate manual input of data into information systems. The most common technologies in AIT are bar codes, contact memory buttons (small metal encased buttons that can store up to 8MB of

data), Smart cards (the DoD Common Access Card is an example), the Optical Memory Card (credit card size, with 4MB of memory) and Radio Frequency (RF) tags. This article will discuss RF tags and the use of them to provide in transit visibility (ITV) for the U.S. Army.

Radio Frequency (RF) tags provide U.S.



Sustainment RFID Tag

Army decision makers, at all levels, in transit visibility (ITV) of equipment, supplies and sustainment stocks moving through the transportation system. During Operation Desert Storm thousands of containers were shipped to the theater of operation yet the contents were not known and so material was reordered. Approximately ten years ago, the Logistics Integration Agency (LIA) began initial funding of the RF tag program to provide ITV for the Army. Prepositioned stocks on ships were tagged, as well as equipment for the operation in Haiti (1994) and hurricane relief in Central America (1996). The RF tag system provides last known location of RF tagged cargo by placing RF readers, called interrogators, at key transportation nodes (gates and rail heads on Army posts, at seaports and airports of debarkation and embarkation, at supply support activities and ammunition depots). Almost all major deployments to Korea and Europe since the mid to late 1990s have used RF tags to provide ITV for the U.S. Army.

Two types of RF tags are available: one is used for sustainment shipments and the other is used for unit movements (placed on vehicles). The two RF tags vary both in physical size and memory capacity.

The sustainment shipment RF tag (model 410) has 128 kb of data storage. This tag is gray, rectangular in shape, and approximately 2.75 inches wide, 8.5 inches long, and 1.5 inches thick. Typically this RF tag is used to list all document numbers and stock numbers for every item on the pallet or in the container. For ammunition, this would include DODIC, lot numbers and other data unique to the ammunition community. The sustainment tag has successfully passed HERO testing. The sustainment RF tag also lists shipping data such as the Transportation Control and Movement Document (TCMD) number and associated data.

The unit movement RF tag (model 412) has less memory (4kb) capacity since less data is required for movement tracking of vehicles. It is also smaller in size 2.75 inches wide, 6.5 inches long and 1.5 inches thick. The unit movement tag's color is a desert tan. Typically unit of assignment, operators, bumper numbers and similar data are stored on this type RF tag.

The RF tag readers, or interrogators look like very large smoke detectors. The interrogators are approximately 12 inches in diameter and about 6 inches thick. The interrogator will be connected, either by hard wire or wireless LAN, to a computer. The computer serves two purposes. First, its software settings determine how often the interrogator sends out a RF signal telling all RF tags in range to respond. When the RF tags respond by sending back with their own unique serial number, the computer software adds the date-time group and interrogator's serial number information to the data string. Second, the computer stores the RF tag response data strings and periodically uploads them to a regional server (Korea, Germany or CONUS). Typically, updates to the regional server occur hourly. The regional server arranges the data so a user, via the Internet, can determine each RF tag's last known

location in the transportation system.

The computer uploads the RF tag data to the regional server by either using a LAN connection or a telephone line and dial into a terminal server. When an RF interrogator needs to be set up in an austere location in a theater of operations, a LAN or telephone line may not be available. In these cases, a satellite telephone will pass the data to the regional server.

RF interrogators were installed in Europe (Germany and Bosnia) in the mid 1990s and in Korea during 1996. All

movements of units, equipment or supplies to Bosnia were required to be RF tagged. All Class IX (repair parts) shipments from DLA depots in Pennsylvania and California bound for Europe and Korea are RF tagged. All major Army installations

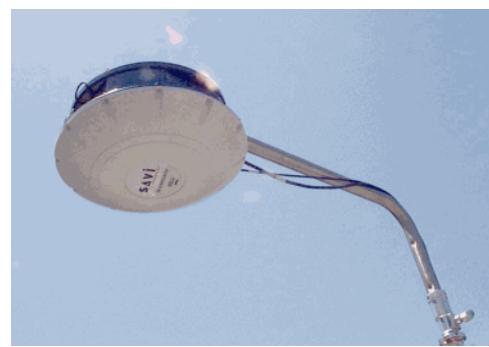
in the United States have interrogators, averaging approximately six to eight per post depending on the number of road and rail gates and installation's requirements to track units through the deployment process. To support Operations Enduring Freedom and Iraqi Freedom approximately 25 deployable RF interrogators are located in seven different countries. Worldwide, there are more than 630 Army RF interrogators to read RF tags and over 550 stations to write information to RF tags.

The RF tags are "active tags" because the database on the RF tag is searchable. For example, a person may stand in a container yard at a port facility and locate the container containing over 500 sets of chemical suits. The query to the RF tag's memory may be compound, by both stock number and quantity. A single six-volt battery approximately the size of a standard AA battery powers the RF tags. When the battery life is low, the RF tag transmits a message that is detected and displayed on the web site indicating what RF tags have low batteries. Generally, a battery can power a RF tag for 20,000 interrogations. Between interrogations the RF tag goes to "sleep", thereby increasing battery life.

The RF tags and interrogators generally have a 90 – 100 meter range but this is dependent upon terrain. At pier facilities, where it is flat with very little interference from buildings and fences, detection ranges of 250+ meters have been observed. Likewise, in areas with many buildings and fences or rolling terrain, operational ranges would be much less.

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SAVI Interrogator Mounted on a Pole Reads
RFID Tags as Trucks Pass By

M734A1 Multi-Option Mortar Fuze

By Mr. William Kurtz



M734A1 MO Mortar Fuze

KDI, a wholly owned subsidiary of L-3 Communications Corporation, has built in excess of 500,000 M734A1 fuzes under contract to PM Mortars at Picatinny Arsenal. This fuze has exhibited a function reliability of 99.82% in Lot Acceptance Testing. The M734A1 is a multi-option fuze for mortars. It is utilized on the 60mm, 81mm, and 120mm mortar projectiles and has selectable proximity, point detonating and point detonating delay fusing modes. It utilizes a state-of-the-art Monolithic Microwave Integrated Circuit (MMIC) sensor that insures accurate Height-of-Burst and Electronic Countermeasure (ECM) hardening. The M734A1F1 is the exportable version that is functionally equivalent to the U.S. design.

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Holston Army Ammunition Plant: “We don’t make the weapon systems...we make them LETHAL!”

By Mr. Mike Tang

CAPT Birdwell and members of the O/EDCA staff visited Holston Army Ammunition Plant (HSAAP) May 8, 2003. Under the leadership of the Joint Munitions Command at Rock Island, IL, HSAAP is a government-owned-contractor-operated facility operated by BAE Systems. The facility produces an array of energetic materials, many of which are used as the main ingredients of high explosive fills or high explosive blocks for weapon systems. For example, products from HSAAP are found in all Navy bombs, numerous missiles, and the Anti-Personnel Obstacle Breaching System.

HSAAP is commanded by LTC Jeffrey Turner and has a Government staff of twenty. Operations at HSAAP are the responsibility of Ordnance Systems Inc. (OSI), which is a part of BAE Systems North America, Technology Solutions Sector. OSI is headed by Mr. Rick Beaulieu and has over 620 full-time and temporary prime and subcontracted employees.

HSAAP sits on 6,024 acres of land near Kingsport, TN. On its premises, there are 30 miles of railroads, 107 miles of roads, 316 buildings, and 130 magazines with 162,000 square feet of storage for explosives.

HSAAP is capable of producing more than 70 explosive compositions. At the peak production period in the 40's, Holston consistently delivered over 300 million pounds of explosives annually in support of the WWII. Although its production rate has declined to just above 2 million pounds in 2000, HSAAP ramped-up its annual production output in FY02 to 8 million pounds mainly to meet the needs of the Navy's bombs. The rate is expected to reach 12 million pounds by FY04, which still will be far below its maximum capacity. BAE/HSAAP invested in a computer control system in FY99 to optimize process efficiency. As a result, the scrap rate and unit costs of the explosives produced in high volume dropped significantly. BAE/OSI won the Tennessee Governor's Manufacturing Excellence Award in 2002 for its demonstrated contribution towards the DoD and our national security.

BAE/HSAAP is upgrading its research and development labs and expanding its pilot plant in anticipation of possible full rate production for future energetic materials. HSAAP's strategic approach to meeting tomorrow's demand from the DoD is through partnering between DoD and industry to further improve its synthesis methodology, facility engineering, and implementation of model-based production control. In addition, HSAAP is a strong implementer of the Armament Retooling & Manufacturing Support Initiative Act, Title 10 USC 4551. The aim is to attract commercial rental of idle HSAAP capacity to reduce plant ownership cost. Additional information is available at <http://www.holston2025.com>.

Our nation's security depends on a strong military force. Munitions are essential to the military weapons systems. For most of the munitions containing high explosives, it all starts at an Army Ammunition Plant called Holston.

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Advanced Conventional Artillery Ammunition Program (ACA2P)

By Mr. John Irizarry

In literature, briefings and discussions, the Denel – Naschem Company of Republic of South Africa (Denel) disclosed improvements to its 105mm and 155mm howitzer and ammunition systems. The improvements resulted in increased range and lethality. As a result, the U.S. Army PEO Ammunition, Project Manager Combat Ammunition Systems, with the technical support of the U.S. Army Research, Development and Engineering Command Armament Research,

**The Current Denel Family of 155MM Artillery Projectiles**

Development & Engineering Center (RDECOM ARDEC) at Picatinny Arsenal tested the Denel projectiles to validate the information and determine if the ammunition would be compatible and suitable for U.S. Forces.

Compatibility testing was completed in June 2002 and validated the performance of the 105mm and 155mm projectiles. The validation included arena tests and ballistic firings from the 105mm M119 Towed Howitzer, U.S. M198 Towed Howitzer, and M777 Towed Howitzer, as well as in 52 and 56 caliber tubes. Tests were conducted at ARDEC and Yuma Proving Ground. The Denel 105mm projectile achieved a range of 15 kilometers when fired from the M119 Towed Howitzer using the same charges as would be used for U.S. projectiles. For comparison, the U.S. 105mm M1 high explosive (HE) cartridge achieves a range of 11.5 km. The Denel 155mm boat tail projectile achieved a range of 25 km. The equivalent U.S. M795 (HE) projectile has a range of 22.5 km. The lethality results showed that the Denel 105mm round averaged four times better lethality than the 105mm M1 and was nearly equivalent to the 155mm M549 rocket assisted high explosive projectile.

If acquired, the Denel ammunition has the potential to improve the U.S. Cannon Artillery capability with ammunition having greater range and lethality. These promising results encouraged OSD to provide the U.S. Army initial funding through their Foreign Comparability Testing Program to perform Safety Assessment testing in FY03. Denel is working with a U.S. partner, General Dynamics Ordnance and Tactical Systems, Inc (GD-OTS), St. Petersburg, FL.

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**The Current Denel Family of Projectiles for 105MM Artillery**

Radford Army Ammunition Plant (RFAAP)

By Mr. James Risner

Members of the O/EDCA visited RFAAP on 6 May 03. The Plant, which is located on 6,901 acres in southwest Virginia, is a Government Owned/Contractor Operated (GOCO) facility that supports numerous weapon systems through production of propellants and ammunition. The Plant is operated by Alliant Ammunition and Powder Company, LLC (<http://www.atk.com/homepage/>). Items produced at RFAAP include M14 propellant for training rounds, JA2 propellant for tactical rounds, and nitro-cellulose for combustible cases in support of the M1A1 Abrams tank; M31A1 stick propellant for artillery; GAU -8/30mm rounds for the A-10/OA-10 Thunderbolt; 2.75 inch Hydra 70 rockets for the AH-64A/D Apache helicopter; and 25mm cannon and TOW missile launch motor for the M2A3 Bradley fighting vehicle.

LTC Brian Butler, RFAAP Commander, led the tour of the Plant. The areas visited included the medium caliber load assemble and pack (LAP) operation, the nitrocellulose production area, and the shear roll mill propellant operation. In addition, the group viewed the production area of Grucci Fireworks, an Armament Retooling Manufacturing Support (ARMS) tenant that produces simulators and fireworks.

Mr. Pat Nolan, President of Alliant Ammunition and Powder Company discussed current operations his company is conducting at RFAAP and the goals and objectives to modernize RFAAP. Some of the key objectives to modernization are the use of lean manufacturing, right sizing facilities with modular designs to allow for rapid expansion, and reducing near and long-term costs by, among other things, reduction of infrastructure footprint.

The May 2003 issue of *Soldiers* magazine contains an article on RFAAP written by SSG Alberto Bentacourt (<http://www.army.mil/soldiers/may2003/pdfs/ammo.pdf>).

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Omni-Directional Transporter (ODT)

By Ms. Diane M. Smith

Multiple lifts required to move an awkward container through tight quarters? Is that container just a touch too long to maneuver into where you want to store it?

Aboard ship, the Navy frequently runs into the logistical challenges of tight quarters and needing to handle large munitions containers.

In 2001 the Military Sealift Command, NFAF, MSNAP Detachment Earle started the At-Sea Evaluation of an Omni-Directional Transporter (ODT). This EE-rated battery powered, remote-controlled transporter allows for easier movement of large or awkward loads aboard ship. One transporter in lieu of two transporters working in tandem provide for increased safety when moving 8,000 pound loads through the ship.

The following pictures tell the story:



The man on the left uses his joy stick remote control device to operate the ODT while the man on the right guides the forklift.



Close quarters aboard ship leave little room to maneuver as these sailors secure the large container onto the ODT. Rotating the joystick clockwise or counterclockwise causes the ODT to rotate about its own axis. Combining translational and rotational motions provide exceptional maneuverability.



By using the remote control the self-propelled ODT can be turned and guided through tight quarters.



The ODT can handle the ramps that are common aboard ships.

The Navy already has several of these ODTs aboard ships. The ODT increases the cargo throughput rate and resolves problems related to intraship handling of long, heavy or oversized containers. For facilities with elevators, ramps or obstacles such as posts and beams, the ODT improves maneuverability capabilities. The ODT also is easy to operate which reduces the skills required to operate it. Almost all components of the ODT are commercial off the shelf items so maintaining the system should reduce life cycle costs. Perhaps this type of advanced logistics mover will be useful in other environments.

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Editor's Note

This quarter we published articles from contractors, developers and O/EDCA personnel. The material covered ranged from support logistics items to items being researched for possible future use. We want to be able to continue to provide useful information that covers the broad spectrum of areas that impact ammunition and ammunition logistics. To do that we need input from our readers.

We would like to have articles submitted from various offices that deal with conventional ammunition in each of the Military Services. Feel free to email your draft article to me at our office address listed below or at my individual email address: dmsmith@hqamc.army.mil. We are looking for articles up to one page in length that tell the story of projects being worked or stories that might share information with the ammunition community. Include pictures whenever possible. If you provide the photographer's name, proper credit can be included in the newsletter.

Feedback on this newsletter is appreciated. We are trying to produce a useful newsletter that contains items of interest to everyone in our community.

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Opinions expressed in this newsletter are not necessarily official policy or endorsed by DoD.

We hope you enjoyed reading our newsletter and we hope it was informative. We encourage feedback.

If you want more information about a particular topic discussed here, please contact the author directly. Also, if you would like to submit pictures or an article for a future newsletter, please contact us via phone or email. Our point of contact information is shown to the left.

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